

WHAT IS CLAIMED IS:

1. A communication receiver apparatus, comprising:
an input for receiving from a communication transmitter apparatus an input analog
communication signal;

5 a feedforward equalizer coupled to said input for producing in response to said input
analog communication signal an equalized analog communication signal;

a sampler coupled to said feedforward equalizer for producing digital communication
information in response to said equalized analog communication signal; and

10 a feedback equalizer coupled between said sampler and said feedforward equalizer
for controlling said feedforward equalizer in response to said digital communication
information.

2. The apparatus of Claim 1, wherein said feedforward equalizer includes a wire
summation node.

15 3. The apparatus of Claim 1, wherein said feedback equalizer includes a digital-
to-analog conversion portion having an input coupled to said sampler for receiving said
digital communication information, said digital-to-analog conversion portion having an
output coupled to said feedforward equalizer.

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4. The apparatus of Claim 3, wherein said feedforward equalizer includes a wire summation node.

5 5. The apparatus of Claim 3, wherein said digital-to-analog conversion portion includes a plurality of digital-to-analog converters having respective inputs coupled to said sampler and having respective outputs coupled to said feedforward equalizer.

10 6. The apparatus of Claim 5, wherein each of said digital-to-analog converters includes a current source digital-to-analog converter.

7. The apparatus of Claim 6, wherein said outputs of said digital-to-analog converters are connected together at an input of said feedforward equalizer.

15 8. The apparatus of Claim 5, wherein said feedforward equalizer includes a wire summation node.

9. The apparatus of Claim 5, wherein said feedback equalizer includes a delay apparatus coupled between said sampler and said digital-to-analog converters for providing said digital communication information to said digital-to-analog converters at respectively 20 different points in time.

10. The apparatus of Claim 1, wherein said input analog communication signal carries a SONET communication.

5 11. The apparatus of Claim 1, wherein said feedback equalizer includes a control input for receiving control information, said feedback equalizer responsive to said control information for controlling said feedforward equalizer, said control information designed to minimize interference at temporal boundaries between data symbols carried by said equalized analog communication signal.

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12. The apparatus of Claim 11, wherein said input analog communication signal is produced by the communication transmitter apparatus in response to further control information, said first-mentioned control information designed in conjunction with the further control information to minimize interference at points in time between said temporal boundaries.

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13. A communication transmitter apparatus, comprising:
an input for receiving digital communication information;
a digital-to-analog conversion portion coupled to said input for producing an analog communication signal in response to said digital communication information;

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an output coupled to said digital-to-analog conversion portion for providing said analog communication signal for transmission to a communication receiver apparatus;

5 said digital-to-analog conversion portion having a control input for receiving control information, said digital-to-analog conversion portion for producing said analog communication signal in response to said control information, said control information defined based on feedback coefficients used by a decision feedback equalizer in the communication receiver apparatus.

10 14. The apparatus of Claim 13, wherein said digital-to-analog conversion portion includes a plurality of current source digital-to-analog converters, and wherein said control information includes weight information for indicating respective amounts of current to be sourced by said current source digital-to-analog converters.

15 15. The apparatus of Claim 13, wherein said control information is defined in conjunction with the feedback coefficients to minimize interference at points in time between temporal boundaries of data symbols carried by an equalized communication signal produced by the decision feedback equalizer.

16. The apparatus of Claim 15, wherein the feedback coefficients are defined in conjunction with said control information to minimize interference at said temporal boundaries.

5 17. A decision feedback equalizer apparatus, comprising:
an input for receiving an input communication signal;
an output for providing an equalized communication signal;
an equalizer coupled between said input and said output for providing said equalized communication signal in response to said input communication signal, said equalizer having
10 a control input for receiving an equalizer coefficient, said equalizer further responsive to said equalizer coefficient for producing said equalized communication signal; and
a coefficient adaptor apparatus coupled to said equalizer for producing said equalizer coefficient, said coefficient adaptor apparatus having an input for receiving information indicative of a temporal relationship between first and second points in time, said first point
15 in time corresponding to an actual occurrence of a temporal boundary between data symbols carried by said equalized communication signal, said second point in time corresponding to an expected occurrence of said temporal boundary, and said coefficient adaptor apparatus for iteratively adapting said equalizer coefficient in response to said temporal relationship information.

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18. The apparatus of Claim 17, wherein said temporal relationship information indicates when said first point in time precedes said second point in time, and also indicates when said second point in time precedes said first point in time.

5 19. The apparatus of Claim 17, wherein said coefficient adaptor apparatus includes logic for producing in response to said temporal relationship information further information indicative of how said equalized communication signal is affected by a current version of said equalizer coefficient.

10 20. The apparatus of Claim 19, wherein said coefficient adaptor apparatus includes a coefficient adaptor coupled to said logic and having an input for receiving said current version of said equalizer coefficient, said coefficient adaptor responsive to said further information for adapting said current version of said equalizer coefficient to produce a corresponding adapted version of said equalizer coefficient.

15 21. The apparatus of Claim 19, wherein said logic includes a lookup table.

22. The apparatus of Claim 17, wherein said coefficient adaptor apparatus is for implementing a LMS algorithm to iteratively adapt said equalizer coefficient.

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23. A method of communication reception, comprising:
feedforward equalizing an input analog communication signal to produce an
equalized analog communication signal;
producing digital communication information in response to said equalized analog
5 communication signal; and
performing said feedforward equalizing step based on said digital communication
information.

24. The method of Claim 23, including converting said digital communication
10 information into an analog control signal, and performing said feedforward equalization step
in response to said analog control signal.

25. The method of Claim 24, wherein said analog control signal is a current
15 signal.